

Bibionidæ.

Plecia dorsalis, Macq., Dipt. Exot. i. p. 86 (1838).

Three females from Pretoria (*W. L. D.*).

Hippoboscidæ.

Hippobosca rufipes, Olfers, De Veget. et Animat. corp. in corpor. animatis reperiundis, Berol. 1816, p. 101; Wiedem., Auss. zweifl. Ins. ii. p. 604 (1830); Schiner, Reise Novara, p. 372 (1866).

Hippobosca maculata, Macq., Suites à Buff. ii. p. 638.

Hippobosca Wahlenbergiana, Jaenicke, Abh. Senck. Gesell. vi. p. 406, pl. xliv. fig. 13.

Four specimens from Pretoria (*W. L. D.*) and Barberton (*Rendall*).

XVI.—*Descriptions of Brazilian Coccidæ.*

By ADOLPH HEMPEL, S Paulo, Brazil.

[Continued from vol. vi. p. 398.]

Genus PHENACOCOCCUS, Cockerell.

Phenacoccus spiniferus, Hempel.

Adult female oval in form, not very convex; pinkish, both surfaces dusted with a white powder; about thirty-six short white tufts around the lateral margin; four anal tufts are slightly longer than the others.

Parasitized females become cylindrical in form and the derm becomes chitinized. The marginal tufts are slightly longer on the posterior margin than on the rest of the body.

Antennæ of nine joints, joint 3 the longest. Length of antennæ varying from .50 to .53 millim. Approximate formula: 3 (1 2) 9 7 8 6 (4 5). Length of the segments of the antennæ: (1) 67, (2) 67, (3) 71, (4) 42, (5) 42, (6) 45, (7) 53, (8) 49, (9) 64. All antennal segments bear hairs. Legs ordinary, not bearing many hairs. Length of segments of first pair of legs: femur, with trochanter, 292; tibia and tarsus 312. Claw short; digitules large, with expanded ends. Tarsal digitules hair-like, with buttoned ends. Eyes small, conical. Rostrum short, about as wide as long, bearing two hairs. Mentum dimerous, with

numerous hairs. Rostral loop reaching to the second pair of legs. Anal ring with six large hairs. Anal tubercles not conspicuous, each one ending in a long seta and bearing two short sharp spines and many hairs and small glands. On the dorsal surface near the lateral margin there are about thirty-five groups of spines, each group consisting of two short sharp spines. Both surfaces bear hairs and numerous small triangular spinnerets. Besides these there are, on the ventral surface of the last five segments of the abdomen, many transverse rows of larger round spinnerets.

Larva (just hatched).—Oval in form; light yellow, eyes brown. Anal tubercles prominent, each ending in a long seta. Antennæ 6-jointed, joint 6 the longest. Legs large; digitules fine, hair-like. Anal ring with six hairs. Rostral loop long, reaching to the end of the body. Length .310 millim.

Hab. São Paulo. In the grooves of the petioles of leaves of a cultivated tree.

Genus SOLENOCOCCUS.

Solenococcus tuberculus, Hempel.

Adult female test oval in outline, dorsum very convex. There is one median longitudinal dorsal row of seven small tubercles; and two rows on each side, the dorso-lateral with six tubercles, the lateral with three tubercles. Around the lateral margin there is a row of from eighteen to twenty tubercles. The caudal end is slightly recurved and is provided with a round aperture. The test is elastic and tough, of a brown colour, but fine lines of whitish wax radiate from the tubercles, giving it a general grey appearance. There are two inconspicuous white lines on the side near the margin; these converge on the ventral surface. The test is securely fastened to the back, within smooth, shiny, of a dark brown colour.

Length 7 millim., width 5 millim., height 3.75 millim.

Adult female smooth, shiny, steel blue above, yellowish beneath, filling the entire test. Boiled in a solution of KOH it colours the liquid light brown. The antennæ are represented by two small tubercles, each bearing a brush of hairs. Legs wanting. Rostrum widely removed from antennæ, situated midway between the two pairs of spiracles. Mentum small, dimerous. Anal ring apparently with eight large hairs. Anal lobes large, the inner edge serrated, bearing several setæ. Just above the anal ring there is a semicircular chitinous plate which bears two hairs at its base. On the

dorsal surface, cephalad of the anal tubercles, there are four groups of large round glands, each group consisting of from eight to thirteen glands. There are double rows of small round spinnerets from the spiracles and antennæ to the lateral margin. On each side near the spiracles there are three or four groups of round spinnerets. Both surfaces bear many filamentous glands, round simple spinnerets, and double spinnerets in the form of a figure 8, these, however, being more numerous on the dorsal surface.

Larva (just hatched).—Elliptical, yellow; eyes small, brown. Antennæ short and thick, of six joints, joint 3 the longest. Rostral loop long, nearly reaching the anal ring. Anal ring bears six thick hairs. Anal tubercles large, each terminating in a long seta, and bearing two short thick spines on the inner margin and several hairs at the base. The lateral margin of the body is serrated and bears several fine hairs. On the dorsum there are six longitudinal rows of double or figure-of-8 glands. Legs short, digitules 4, very long and slender.

Length .52 millim.

Hab. São Paulo. On *Baccharis* sp.; singly on the stem near the ground.

The young emerge from the test through the caudal aperture.

Solenococcus baccharidis, Hempel.

Adult female test light brown, oval, smooth; dorsum very convex. Young specimens sometimes exhibit a few small tubercles on the dorsum. Radiating from the lateral margin there are from eleven to thirteen short whitish filaments or processes. The test is thin, elastic, and tough, the caudal end being slightly recurved and bearing a small round orifice. Below there are two converging white lines on each side.

Length 4 millim., width 3.20 millim., height 2.50 millim.

Adult female, denuded of wax, dark brown, derm shiny. Boiled in a solution of KOH it colours the liquid a deep yellowish brown. Antennæ represented by two tubercles, each bearing a brush of hairs. The legs are usually wanting, but may be present in the younger individuals as tubercles, each terminating in a claw. Rostrum large, situated between the first pair of spiracles. Mentum dimerous. The posterior end of the abdomen is chitinized and prolonged into a tail, which bears the anal ring and tubercles. Anal ring with eight large hairs. Just above the anal ring there is a semi-circular chitinous plate, with two hairs at the base. Anal

tubercles prominent, each ending in a long seta and bearing several shorter ones. There are double rows of round spinnerets from the spiracles and antennæ to the lateral margin. Both surfaces bear many filamentous glands, figure-of-8 spinnerets, and some hairs and simple round spinnerets. The glands and spinnerets are more numerous on the dorsal surface.

Larva (just hatched).—Very active, elliptical, yellow; eyes small, brown; antennæ of six joints, joint 6 is the longest, joint 3 nearly equals joint 6 in length. Rostral loop long, nearly reaching the anal ring. Anal ring of six hairs. Anal tubercles prominent, each terminating in a long seta and bearing on the inner margin two short curved spines, and several hairs at the base. Legs long, stout; digitules 4, very long and slender. Lateral margin of the body serrated and bearing short hairs. Dorsum bears six longitudinal rows of figure-of-8 glands.

Length .44 millim.

Hab. Ypirauga and São Paulo. On trunk and branches of *Baccharis dracunculifolia*.

It is sometimes found in large numbers and is securely fastened to the bark.

Genus *CRYPTOKERMES*, Hempel.

Adult female resembling *Kermes*; enclosed in a rough spherical test. Legs and antennæ nearly obsolete. Caudal portion of derm with a dense mass of sharp spines. Abdomen bears seven pairs of spiracles.

Type *Cryptokermes brasiliensis*, Hempel.

Cryptokermes brasiliensis, Hempel.

Adult female test rough, hard, brittle, spherical, with a round orifice at the caudal end; semitransparent, dark brown in colour; 6 millim. in diameter. Adult female light yellow, filling the entire test. Derm soft, except in the caudal region, where it becomes chitinized, and has massed upon it a large number of sharp spines. Antennæ not observed. Legs represented by small tubercles with large claws, serrated on the inner edge.

Two pairs of large spiracles are present on the thorax and seven pairs of smaller ones on the abdomen.

Anal ring hairless. The caudal end of the intestine is chitinized for a short distance and bears a thick collar, which sometimes shows reticulations. Both surfaces of the body

are covered with small and large round spinnerets and hairs with tubercular bases.

Female (second stage).—Test elongate, elliptical, the ends nearly acuminate. It is rough like the adult, but not so brittle. The roughness is due to the fact that the test is secreted and formed from small globules of wax. Denuded of the test it is oval in form, buff in colour, with eight or nine deep transverse furrows on the dorsum. The dorsum also bears near the lateral margin the seven pairs of spiracles, which open into the furrows. The external openings are surrounded by a small quantity of white powdery secretion, and are readily seen with a lens. Under the insect there is a slight cushion of white powdery secretion.

Boiled in a solution of KOH it makes the liquid turbid, giving it a light yellow colour. The antennæ are represented by short thick tubercles, with a terminal brush of stiff hairs. Legs are represented by thick tubercles, with minute claws. Rostrum is large, extending from the antennæ beyond the first pair of legs. Mentum large, dimerous. Rostral loop very long, usually coiled. Two small oval eyes are situated just in front of the antennæ. Collar on the intestine, and spines and spinnerets the same as in the adult. The abdomen also bears on the ventral surface masses of minute hairs.

Hab. Poços de Caldas, State of Minas Geraes. Very abundant on limbs and trunk of *Schinus* sp., a kind of matté.

Frequently the tests of 2–6 individuals coalesce, forming one mass. The females of the second stage usually secrete from the caudal end a stiff tube of white wax, which usually has a small drop of clear liquid on the end. I had at first thought this insect might be a *Kermes*, but on studying it closely I found that a new genus had to be erected for it. Prof. T. D. A. Cockerell, to whom I sent specimens, also thought that it belonged to a new genus.

Genus STIGMACOCCUS, Hempel.

Adult female forming a more or less spherical test, with a large aperture on the apex. Antennæ 7- or 8-jointed. Anal ring hairless. Abdomen with eight pairs of spiracles.

Type *Stigmacoccus asper*, Hempel.

Stigmacoccus asper, Hempel.

Adult female test large, chrome-yellow, the outside blackened by a fungus and very rough; inside smooth and shiny. The shape is more or less spherical, slightly compressed laterally, with a round or elongate hole on the apex.

This hole is from 1 to 1.5 millim. in diameter. The inside of the test is spherical, with two rows of small white spots of secretion, corresponding to the stigmata of the abdomen. Frequently a large part of the abdomen is protruded out of the apical hole; but usually only a fine white thread protrudes from it. Length 9 millim., width 7-8 millim., height 8.5 millim. The thickness of the wall of the test is 1.25 millim. to 2 millim. The wax is brittle. The diameter of the cavity is about 5 millim. The female, removed from the test, is flat, nearly elliptical in shape, with the abdomen slightly attenuated posteriorly. It attains a length of 11 millim., and a width of 6.5 millim. Colour yellow, with a pinkish tint; derm very soft, except on the head, where there is an area of the derm chitinized, flat, and of a dark brown colour. The abdomen is transversely wrinkled. Boiled in a solution of KOH it colours the liquid a deep purple, almost black. The derm becomes soft and colourless, except in the cephalic region.

Antennæ variable, of seven or eight joints, although eight is the typical number. Length about .950 millim., each joint bears thirty or more hairs. Length of joints: (1) 178, (2) 110, (3) 110, (4) 110, (5) 110, (6) 110, (7) 89, (8) 141. Approximate formula: 1 8 (2 3 4 5 6) 7. Legs long and full of hairs. The coxa is nearly twice as wide as long; the trochanter bears about thirty round glands; the tibia is frequently bent back near the distal end, while the tarsus is always curved. Length of joints of first pair of legs: coxa 187, trochanter and femur 812, tibia 687, tarsus 350, claw 97. Claw sharp, much curved, with two short hair-like digitules. Tarsal digitules wanting. Rostrum ordinary, situated close to the antennæ. The abdomen bears eight pairs of spiracles, each with a number of small pentagonal spinnerets around the external opening. The thoracic region also bears two pairs of stigmata; these are large, chitinized, with the external orifices flask-shaped, and many small spinnerets grouped about them. Anal ring hairless. The derm on the posterior end of the body is thickly set with peculiar glands, disk-shaped, and apparently three-celled. The remainder of the derm bears numerous small hairs and glands.

Hab. On the bark of the ingá tree (*Inga* sp.), growing along the banks of the Rio Mogy-guassú, near Pirassununga, State of São Paulo; and from Joinville, State of Catharina. The insects are usually crowded on the underside of the limbs and branches, and are covered with a black fungus, and accompanied by many individuals of an ant (*Camponotus* sp.).

Genus *APIOCOCCUS*, Hempel.

The female constructs a flexible, spherical test. Legs wanting. Antennæ represented by small tubercles. Anal ring hairless. The cephalic portion of the derm bears a mass of small round spinnerets.

Type *Apiococcus gregarius*, Hempel.

Apiococcus gregarius, Hempel.

Adult female test spherical, hard and tough, with a small round orifice on one side. Surface slightly roughened, not shiny, of a dark sepia-brown colour. Size 2 to 3 millim. in diameter.

Adult female spherical, filling the entire test, light yellowish brown in colour. Boiled in a solution of KOH it colours the liquid light yellow. The cephalic portion of the derm is chitinized and bears a large number of spinnerets and some hairs. Antennæ, small tubercles, with a terminal brush of thick stiff hairs. Rostrum large, rectangular, occupying the space between the two pairs of spiracles. Mentum dimerous with bifid tip. Anal ring hairless. Anal tubercles not conspicuous, each one bearing about 12 sharp spines. Around the anal orifice there are about 50 more sharp spines, and about 80 small round glands, arranged in two elongate masses. The derm, especially near the caudal region, bears many small round spinnerets and hairs. The derm also has many invaginations, forming small pockets. Scattered over the ventral and dorsal surfaces are many peculiar conical spines. These spines are characteristic, and are possessed by every member of this genus.

Larva (just hatched).—Oval, orange-yellow in colour. Antennæ of six joints; joint 6 the longest. Legs short and thick, claws greatly curved; digitules 4, long, with buttoned ends. The abdomen terminates in two long setæ. Anal tubercles not developed. On the dorsal surface, between the setæ, there are eight sharp spines. The lateral margin also bears several sharp spines. On the lateral margin of the abdomen and head there are about twenty-four large, blunt, club-shaped spines, and on the dorsal surface about sixteen longer ones. Those on the dorsum are arranged in one transverse row of six, on last segment of the thorax; and two sublateral rows of five each, on the head and thorax. Rostral loop long, extending to the end of the abdomen. Size .360 millim. long.

Hab. Ypirauga, State of São Paulo.

Crowded together on the twigs of a plant of the order Myrtaceæ.

Apiococcus singularis, Hempel.

Adult female test spherical, with a small round orifice in one side. Outer surface rough, black; but beneath the surface it is a dark coffee-brown. Inside of test smooth, dark brown, covered with white powdery secretion. Size of largest specimens 5 millim. in diameter.

Adult female spherical, light yellow in colour, filling the entire test. Boiled in a solution of KOH it colours the liquid a golden yellow. Derm semichitinous, with many small round spinnerets massed on the cephalic region. Antennæ, small tubercles, with the usual terminal brush of stiff hairs. Rostrum large, but placed farther cephalad than in the preceding species. Legs wanting. Anal ring hairless. The spiracles are tubes with both ends expanded into disks. The outer disk is densely set with round spinnerets. A great number of fine tracheæ radiate from the inner opening. Anal tubercles not developed, but indicated by a mass of six or seven sharp spines on each side. Clustered around the anal orifice there are about sixteen small, sharp spines, two longer setæ, and many small round spinnerets. The derm bears the customary spinnerets, hairs, invaginations, and peculiar conical spines. The invaginations or pockets are large and nearly spherical, one individual having nearly forty of them.

Larva (just hatched).—Elliptical, light yellow in colour. Antennæ of six joints, joint 6 the longest, but joint 1 nearly equalling it in length. Legs short and thick. Digitules 4, slender; rostral loop long. Anal tubercles not developed. The abdomen ends in two long setæ, between which are six short, sharp spines and two long hairs. Around the margin there are from twenty-eight to thirty short, thick spines. On the thorax and head there are ten short, thick spines, arranged in two longitudinal submedian rows of five spines each. Length .340 millim.

Hab. Ypirauga, State of São Paulo.

Scattered singly on twigs of a shrub of the order Myrtaceæ.

Apiococcus asperatus, Hempel.

Female test spherical, hard, thick, black, the outside roughened by small tubercles. Beneath the surface it is a dark brown colour. The inside of the test is smooth, and is coated with a thin layer of white secretion. Size 3 millim. in diameter.

Female spherical, filling the entire test; light yellow in colour. Boiled in a solution of KOH it colours the liquid

light yellow. Derm partly chitinized, with a large mass of round spinnerets on the cephalic portion. Antennæ close together, as small tubercles, with a terminal brush of stiff hairs. Legs wanting. Rostrum large, situated between the two pairs of spiracles. Spiracles smaller than in the preceding species, but with many spinnerets on the external orifice, and a large number of fine tracheæ radiating from the inner orifice. Anal ring hairless. Anal tubercles not developed, but indicated by a mass of about ten spines on each side. Besides these, there are around the anal orifice about thirty spines, two long and two shorter setæ, and about eighty round spinnerets arranged in two elongate masses. The derm bears the customary spinnerets, hairs, and conical spines. The invaginations of the derm are few and small as compared with those of *A. singularis*.

Hab. Ypirauga, State of São Paulo.

Singly on twigs of a plant of the order Myrtaceæ.

Apiococcus globosus, Hempel.

Test of the adult female spherical, hard, and tough, with the inside and outside smooth, and with a small circular orifice in one side. Colour white, with a creamy tinge. The tests of the immature insects are oval. Size of largest test 2.75 millim. in diameter. The material of which the test is made is of a horny nature, and does not dissolve in a solution of KOH.

Adult female globose, filling the entire test; light yellow in colour; abdomen with several transverse wrinkles. Derm soft, with a large number of small round spinnerets massed on the cephalic area. Antennæ small, of two segments, with a terminal brush of stiff hairs. Legs wanting. Rostrum large, rectangular, situated between the two pairs of spiracles. Mentum dimerous. Rostral loop long, folded upon itself. Spiracles large, disk-shaped; the outer disk thickly set with round spinnerets, the inner end surrounded by a large number of fine radiating tracheæ. Anal ring hairless. Anal orifice surrounded by about sixteen sharp spines and numerous spinnerets. The derm bears large numbers of spinnerets, some hairs, and the characteristic conical spines. The invaginations of the derm are small, but numerous.

Hab. São Paulo. On the bark of a shrub of the order Myrtaceæ.

Genus *TETOCOCCUS*, Hempel.

Female gall-forming; body ovate. Legs present. Antennæ of six joints. Anal ring hairless.

Type *Tectococcus ovatus*, Hempel.

Tectococcus ovatus, Hempel.

Female forming circular galls convex on both sides, like a lens. The gall is formed on both sides of the leaf, with an aperture on the underside. The sides of the gall are usually slightly elevated around the aperture, which is filled with a mass of loose white secretion. The inside of the gall is spherical and smooth, and is dusted with a white powder. Galls about 8 millim. in diameter and 5 millim. thick.

Adult female ovate, inflated, the caudal end acuminate; brown, dusted with a white powder. Derm soft. Dorsum transversely wrinkled. Length 2.10 millim., width 1.50 millim. Antennæ close together, short, thick, of six joints, joint 1 being the longest. Length of antennæ .217 millim. Length of the joints: (1) 49, (2) 30, (3) 30, (4) 36, (5) 30, (6) 36. Approximate formula: 1 (4 6) (2 3 5). All the joints, except joint 3, bear hairs. Legs ordinary. Length of the joints of first pair of legs: femur with trochanter 151, tibia 98, tarsus with claw 84. Digitules of tarsus and claw not very long, stout, with expanded ends. The trochanter bears one very long hair and one shorter one. Rostrum large, situated near the antennæ. Mentum apparently monomerous. Anal ring hairless. Anal orifice guarded by four sharp spines. Anal tubercles not present. The abdomen ends in two short setæ. The derm bears many small round spinnerets and rather long hairs.

Eggs small, elliptical; light yellow in colour.

Hab. São Paulo and Ypiranga, State of São Paulo.

The galls are produced on the leaves of a shrub of the order Myrtaceæ.

Subfamily *ASTEROLECANIINÆ*.Genus *LECANIODIASPIS*, Targ.*Lecaniodiaspis rugosus*, Hempel.

Adult female scale oval to subcircular, light brown in colour. Dorsum transversely wrinkled and with a slight longitudinal ridge, and covered with a thin grey secretion of wax. The lateral margin is ornamented by a border composed of from twenty to twenty-five bits of wax.

Length 3.25 millim.; width 2.75 millim.; height .50 millim.

Adult female broadly oval in outline. Antennæ cylindrical, variable, of eight joints. Average length .302 millim. Approximate formula: 4 (2 3 5 6) 1 7 8, or 3 4 (2 5) 6 1 (7 8).

Length of joints: (1) 31, (2) 45, (3) 45, (4) 49, (5) 45, (6) 45, (7) 25, (8) 22. All of the joints except joints 3 and 4 bear hairs. Rostrum large; rostral loop long. Legs present as short cylindrical tubercles terminating in a long claw. Spiracles small, close together, with a few round spinnerets about the orifice. Anal ring apparently with ten hairs. Just behind the anal ring there is a chitinous plate with a deep notch in the middle. The abdomen ends in two inconspicuous tubercles, each bearing a terminal seta and a few short spines. Around the lateral margin there are a few short, sharp, spine-like hairs. On each side of the cephalic region on the dorsal surface there is a group of two large spines, one longer than the other; behind these there is another spine, and behind the second one another, so that we have two longitudinal rows of four spines each. These spines are large, slightly curved, with the ends rounded and slightly expanded, and are from 53 to 66 μ long. The entire surface of the body is thickly set with small V-shaped spinnerets and numerous fine filamentous glands about 44 μ long.

Male scale cream-coloured, elliptical, rounded at both ends; transversely wrinkled, and with a longitudinal median ridge and a slight groove around the dorsum near the lateral margin. Length 1.50 millim.; width .50 millim.

Hab. Ypirauga, State of S. Paulo. Thickly covering the trunk and branches of an unidentified forest-tree.

Should this insect attack cultivated trees, it would do much harm by its great numbers.

This species has a superficial resemblance to *L. celtudis*, Ckll., but can be readily distinguished by the segments of the antennæ, the absence of functional legs, and the presence of spinnerets and filamentous glands.

Subfamily *TACHARDIINÆ*.

Genus *TACHARDIA*, Blanch.

Tachardia cydoniæ, Hempel.

Adult female scale dark coffee-brown, smooth, shiny, slightly elongated, with three processes or rays on each side. Dorsum not very convex, with a slight hump in the middle, behind which is an opening with the lac slightly raised around it. Lac not brittle.

Length 3.75 millim.; width 2.50 millim.; height 1.50 millim.

Adult female boiled in a solution of KOH colours the liquid a deep red. The insect is slightly longer than wide

and has three slight lobes on each side. The antennæ are short and thick, about .093 millim. long, and apparently composed of four segments. The last joint has several short terminal hairs. The mentum and rostrum are well developed and close to the antennæ. Rostral loop short. The two lac-glands are large and have the opening guarded by six or more short sharp spines. Near the lac-glands there are two large spiracles that have forty to fifty round spinnerets about the external orifice. Near the rostrum there is another pair of smaller spiracles. The legs are sometimes present as small sharp tubercles. The dorsal horn is strong and straight, blunt, .110 millim. long. Anal ring with ten long hairs. Around the anal ring, and enclosing it, there is a chitinous horn or collar, which bears twelve short plates; these plates may vary in number. The sides are nearly parallel and the ends finely serrated. The collar bears many minute tubercles and several short hairs at the base. On the dorsum, between the collar and the dorsal horn, there are four tubercles, each one bearing fifty to sixty large round spinnerets. On the ventral surface, near the antennæ and spiracles, there are four groups of about fifteen small elongate glands each. The derm bears a few spinnerets and small hairs. Length 2 millim.; width 1.50 millim.

Larva (just hatched).—Small, elongate, dark purple, almost black. Antennæ of six joints; joint 6 the longest, joint 3 the next longest, joint 5 bears two very long hairs. Rostral loop long. Legs slender, long; tarsus and claw each with a pair of digitules. The body ends in two very long setæ, at the base of which are several short spines. Between these is the chitinous ring, bearing six or eight processes. Within this ring is the anal ring, which bears six hairs. There is a notch on each side on the prothorax, in which are situated the large spiracles. The openings of these spiracles are furnished with about ten round spinnerets. On each side of the dorsum there are three or four longitudinal rows of small tubercles, each one ending in a hair. On the ventral surface there are two longitudinal median rows of short hairs. Length .440 millim.

Hab. S. Paulo. On cultivated quince, *Cydonia* sp.

The insects are usually found singly on the underside of the branches. Sometimes the lac of two or three individuals will fuse.

Tachardia rubra, Hempel.

Female scale, when occurring singly, nearly circular, with a slight tendency to form five or six lobes. The lac from

different individuals usually fuses, but does not form large masses. The outside is dull and smooth, with many filaments of white secretion scattered over it. The lac is a red-orange colour and brittle only in very old specimens.

Size of largest individuals:—Length 5 millim.; width 4·25 millim.; height 2·5 millim.

Adult female denuded of wax, subcircular, convex, with a tendency to form six lobes. Boiled in a solution of KOH it colours the liquid a deep red. The lac-glands are large, club-shaped, and do not have the spines at the external opening as in *T. cydoniæ*. The antennæ are apparently of four segments; they are ·084 millim. long, club-shaped, and the terminal joint bears two short hairs. Rostrum and mentum small. Rostral loop short. Legs wanting. Anal ring with ten large blunt hairs, which protrude but little beyond the chitinous ring. The chitinous plates on the caudal ring are ten in number, with nearly parallel sides, and the ends coarsely serrated. The dorsal horn is ·089 millim. long, blunt, and slightly curved at the base. The large spiracles are close to the lac-glands and have many spinnerets around the external orifice. The small spiracles are situated near the rostrum and have twelve to fifteen spinnerets about the external orifice. The four tubercles between the caudal ring and dorsal horn are well developed and bear many round spinnerets. The surface of the body bears many small tubercles, each ending in a hair. The four groups of elongate glands found on the ventral surface of *T. cydoniæ* were not seen in this species.

Length 3 millim.; width 3 millim.; height 2 millim.

Larva as in *T. cydoniæ*. Length ·500 millim. The rostrum is very large and the rostral filaments are longer than in the preceding species.

Hab. Cachoeira and Santa Barbara, State of S. Paulo. Clustered in great numbers on the branches of a species of *Croton* and on other plants.

Tuchardia parva, Hempel.

The younger females have a test of brown lac, elongate, with a tubercle in the middle of the dorsum and three processes on the lateral margin on each side. In the older specimens the test is globular and of an orange-brown colour.

Specimens varying from 2–2·75 millim. long and 1·25–2 millim. high.

The female, denuded of wax, has three conspicuous lobes on each side. Length about 1·25 millim.; width ·75 millim.

Boiled in a solution of KOH it colours the liquid deep pink. The antennæ are short and nearly of equal thickness throughout. The lac-glands are large and very near the large spiracles. Around the opening of the large spiracles and between these and the other spiracles are many spinnerets. Rostrum and mentum large; rostral loop short. The legs are represented by inconspicuous short, sharp tubercles. On the ventral surface in front of the antennæ there are two groups of about sixteen elongate glands each, and behind the antennæ there are two more groups of from eight to ten glands each. The dorsal horn is .146 millim. long, sharp, with two small tubercles at the base. The anal ring bears ten long sharp hairs, which protrude almost their entire length beyond the chitinous collar or caudal ring, and flare outwards. The caudal ring is large and bears many minute tubercles and a few hairs at the base. This ring terminates in ten short chitinous plates, which have nearly parallel sides and the ends deeply and irregularly incised. The four tubercles on the dorsal surface between the caudal ring and dorsal horn are small, but bear from forty to fifty round spinnerets each. The entire surface of the body is covered with small tubercles, each one terminating in a hair. The ventral surface has the appearance of bearing many transverse rows of minute hairs.

Hab. Cachoeira and Ypirauga, State of S. Paulo. On twigs of a bush of the order Myrtaceæ.

Many of the insects are covered with a black fungus. The individuals are usually distinct, the lac seldom fusing.

Tachardia rosæ, Hempel.

Female test elongate, deep orange-red in colour, with a hump on the dorsum and three processes on each side radiating from the lateral margin, giving it a star-shaped appearance. There are usually two fine filaments of white secretion in front of the dorsal hump, probably arising from the large spiracles. Many of the individuals are distinct, with soft plastic lac, but in the older specimens the lac is hard and brittle and usually fused into larger masses.

Average size :—Length 4 millim. ; width 3 millim. ; height 1.75 millim.

The adult female, denuded of wax, has three small tubercles on each side. Boiled in a solution of KOH it colours the liquid a deep red claret-colour. Antennæ small, club-shaped, with two or three short hairs on the last joint. The joints are confused and indistinct, but appear to be four. Length

·089 millim. Rostrum and mentum ordinary. Rostral loop short. Legs wanting. The external openings of the large pair of spiracles are surrounded by about sixty round spinnerets. The small spiracles are close together and have five or six spinnerets at the external opening. The four dorsal tubercles between the caudal ring and dorsal horn are small, each one bearing about forty spinnerets. Dorsal horn straight and sharp, ·151 millim. long. Anal ring with ten large hairs, which do not protrude far beyond the caudal ring. The chitinous caudal ring ends in ten plates and bears many minute tubercles and several small spines at the base. The chitinous plates are short, narrow at the base, with the ends expanded and serrated. On the ventral surface, near the antennæ and spiracles, are four groups of about sixteen elongate glands each. Scattered over the body are six or more areas in which the derm is partly chitinized and bears minute hairs and glands.

Larve elliptical, as in *T. cydonice*. Length ·450 millim.

Hab. São Paulo. Clustered on the branches of cultivated roses in various parts of the city.

Tuchardia ingæ, Hempel.

Adult female scale subglobular, dorsum slightly flattened, with an aperture in the centre. The lac is dull, shiny when the surface becomes rubbed, semitransparent, thick, brittle, light green with brown stripes. Some fine white filaments usually protrude from the dorsal orifice. The lac of many individuals usually unites to form a confused mass.

Diameter 5·25 millim.; height 3·75 millim.

Denuded of lac the insect is three-lobed. Lac-tubes and horn all of equal length and standing erect on the dorsum. Length 3·50 millim.; width 3 millim.; height 2·50 millim.

Boiled in a solution of KOH it colours the liquid very deep purple.

Antennæ, small tubercles about ·110 millim. long, apparently consisting of six joints. Legs represented by very small conical tubercles, ending in a claw. Length of the first pair 18 μ . Antennæ very close together. Rostrum large, placed just behind the antennæ. Rostral loop short. First pair of legs inserted very close to the rostrum. The large stigmata have each about 140 to 150 spinnerets around the external orifice, while the small ones have each 10 to 12 spinnerets around the external orifice. Dorsal horn straight and blunt, about ·173 millim. long. Lac-glands large, with an oblong orifice lined with numerous glands. Anal ring

with ten long diverging hairs. The plates of the chitinous ring are deeply incised. The posterior dorsal tubercles each with 45 to 70 round spinnerets. The derm also bears many small glands and spinnerets.

Hab. On branches of *Inga* sp., growing along the banks of the River Mogy-guassú, near the town of Mogy-guassú, State of S. Paulo.

This insect has a peculiar appearance and resembles a berry or seed so closely as to be deceiving.

[To be continued.]

XVII.—*Contributions from the New Mexico Biological Station.*

—X. *Observations on Bees collected at Las Vegas, New Mexico, and in the adjacent Mountains.* II. By T. D. A. COCKERELL*.

Colletes americana, Cresson.

Las Vegas, Aug. 11, at flowers of *Solidago canadensis*, 1 ♀ (*W. Porter*).

Colletes bigeloviae, Ckll.

Beulah (*W. Porter*).

Colletes gilensis, Ckll.

Las Vegas, July 21, at flowers of *Petalostemon oligophyllus*, 4 ♀ (*Ckll.*); Aug. 1, 3 ♀ (*Porter & Ckll.*); Gallinas River at La Cueva, Aug. 6, 2 ♀ (*Porter & Ckll.*). The joints of the palpi measure as follows in μ :—Maxillary palpi, (1) 200, (2) 110, (3) 140, (4) 130, (5) 110, (6) 110; labial palpi, (1) 170, (2) 150, (3) 140, (4) 160.

Petalostemon oligophyllus is the plant heretofore reported from Las Vegas as *P. caulidus*; I am indebted to Miss A. M. Vail for the correct identification.

Prosapis basalis, Smith.

Beulah, July 28, 1 ♂ (*Ckll.*). New to New Mexico. This and other species of *Prosapis* were taken on moist ground by a stream.

Prosapis mesillæ, Ckll.

Las Vegas, June 19, at flowers of alfalfa, ♀ (*Ckll.*); Aug. 4, ♂ (*W. Porter*).

* The first part of this paper appeared in *Ann. & Mag. Nat. Hist.*, May 1900, p. 401.